G-035

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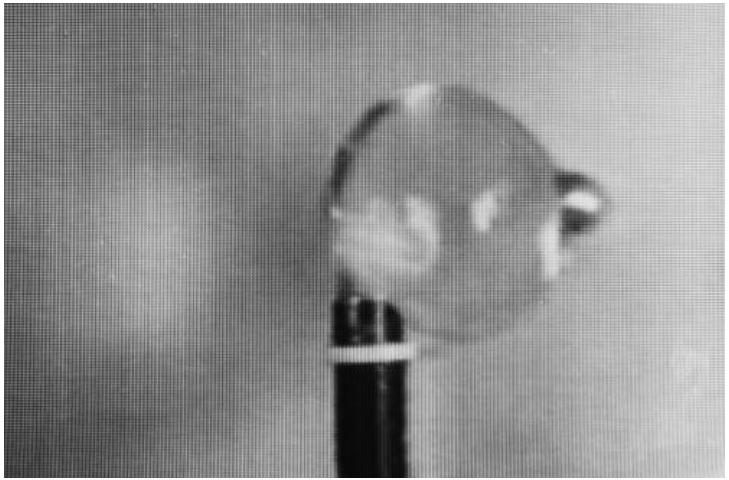
Customer: The Asahi Shimbun; Shigeru Kimura
Payload Mgr: Asahi National Broadcasting Co., Ltd.; Kazuo Fujimoto
NASA Tech Mgr: Mark D. Goans
Mission: STS-51-D, April 12, 1985

On the first flight of the Asahi National Broadcasting Company's payload (G-032 on STS-41-G) the materials processing experiments went smoothly, but the water in the Water Ball Collision experiment froze. The company arranged a reflight, G-035, adding more heaters to the second payload. This time, spheres of water formed as planned. BBs were fired into the spheres at varying speeds to learn if they could overcome the surface tensions. Video cameras recorded the fascinating collisions, yielding new insight on the force of surface tension in microgravity. The success of this payload's second flight clearly demonstrated the value of being able to retrieve, evaluate, modify, and refly experimental payloads flown aboard shuttle missions.



Metal BBs hitting water spheres in space gave G-035's researchers more knowledge about surface tension of water in microgravity.

G-471

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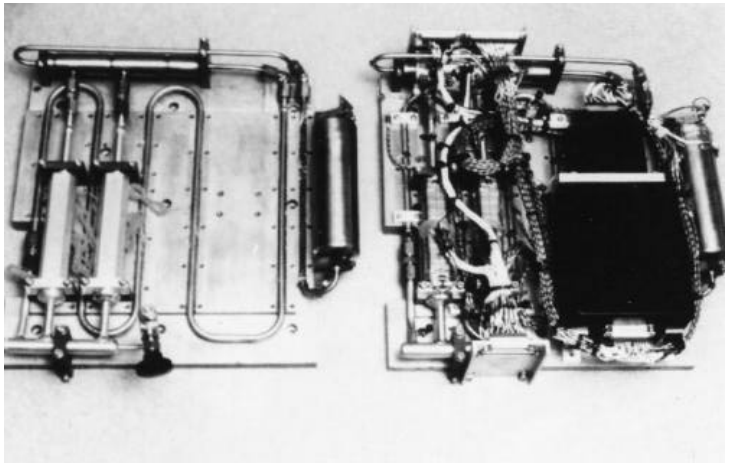
Customer: Goddard Space Flight Center;
Noel W. Hinners
Payload Mgr: Roy McIntosh
NASA Tech Mgr: Gerard Durback
Mission: STS-51-D, April 12, 1985

Based on a natural process: the same principal by which plants transport water from their roots to their leaves was used in designing the Capillary Pumped Loop experiment. The purpose of this Goddard payload was to demonstrate that a capillary pumped system could transfer waste heat from a spacecraft out into space. The two pumps in the system, built by the OAO Corporation, had no moving parts. Instead, each pump contained a wick of porous material saturated with fluid. When heat was added to the fluid, it evaporated, producing a pressure gradient or pumping action that circulated the fluid (the same action by which water ascends plant stems). The fluid traveled—transporting the heat—to a condenser. This entire system, mounted on a condenser plate, was attached to a special GAS container top plate designed by the experimenters; through this the heat radiated into space.



Capillary Pumped Loop Experiment: the condensation loop and fluid management system could be seen (L) before the electronics, heaters and sensors were integrated on the payload (R).